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(56) Documents Cited

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EP 0831469 A2 WO 98/54704 A1 WO 98/38637 A1

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(54) Abstract Title

Dual format optical disc playing and recording apparatus

(57) Stored data playing and/or recording apparatus is able to play and/or record stored data on a disc which in addition to carrying DVD data in a first format also carries data in a second format that is compatible with the conventionally provided compact disc audio data. A dual format data storage disc uses a first format adapted for storing video data in DVD format and a second format for storing audio data in a format which enables the dual disc to be used in with apparatus for playing both formats and with apparatus intended for playing either one of the formats.

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DATA RECORDING ARRANGEMENTS

This invention relates to data recording and is concerned with data recording arrangements utilising the DVD recording media format.

In particular the present invention is concerned with a DVD video recording and playback apparatus intended for use for professional audio visual production and broadcast use. the Apparatus is effectively based upon the principals of a
5 consumer DVD video recorder but is in accordance with the invention provided with extra facilities involved for professional use.

Broadly according to an aspect of the invention there is provided apparatus capable recording DVD data to be recorded in any one of or all of the formats
10 associated with DVD recording such as for example, DVD-5, DVD-9, DVD-10 and DVD-16 formats.

Preferably, the multi-format recording capability is based upon enhancing or upgrading the chassis /motherboard of a DVD recorder intended for consumer use and/or the formation of a machine dedicated to the utilisation of the aforesaid
15 DVDs.

In order to satisfy the concepts of the invention it is proposed to provide a DVD recorder including at least the following features:-

A balanced audio input/output arrangement adapted for effecting access to various tracks on a disc including MPEG-2 audio encoding, PCM or Dolby
20 Digital in mono, stereo or multitrack including;

Time code (VITC) which can be internally or externally generated and synchronised into a video stream.

RS-422 and control synchronisation inputs and outputs or any of these combinations;

Direct inputs/outputs of the MPEG-2 and audio streams to enable users such as broadcasters to interface the DVD/AUDIO format of the invention directly with
5 the MPEG-2 output to be finally broadcast and to allow users such as producers to encode material in the correct format for MPEG-2 digital broadcasts;

Serial digital component RGB and YUV, IEE1394 (fireware), Y/C composite and sync inputs/outputs;

The apparatus will be provided with USB, SCSI and serial ports to allow the
10 apparatus to interface with computers and workstations for the control, synchronisation, data back-up, internal black burst, test signals and colour bar generation;

A reference input for locking to an external source;

TOC written to an area of the disc and available access to the discs technical
15 information is either via the GUI or is displayed on a monitor.

Apparatus adapted to utilise the DVD format in accordance with the concepts of the invention provides a recording and playback capability that affords many distinct advantages of the equipment currently available utilising current tape based formats including running times

20 A further aspect of the invention relates to discs for the storage of data and is more particularly concerned with data storage discs associated with DVD format discs.

- It will be appreciated that circuitry specific to the above mentioned features are well known and that such circuitry is available by recognised manufacturers for the construction of recorders whereby it is thought that a detailed discussion of a circuit is not required. It is believed that the constructional situation in relation to
- 5 a recorder capable of reading DVD format and audio format as mentioned above has the analogous situation in relation to the provision of particular features in a personal computer wherein components for producing a particular function are readily pluggable into a mother board which incorporates the processor used in the computer.
- 10 Broadly according to a further aspect of the present invention there is provided a dual format disc in which in a first format stores video data in DVD format and in a second format stores audio data in a format which enables the dual disc to be used in with apparatus for playing both formats and with apparatus intended for playing either one of the formats.
- 15 Broadly according to a further aspect of the present invention there is provided DVD format disc which stores DVD format audio and video material and which additionally stores audio material in such manner that the additionally stored audio material format is playable by equipment capable of playing audio material containing compact discs only.
- 20 A further aspect of the invention provides apparatus for the playing of dual format audio and video material storing discs, each of which in a first format stores DVD video/audio material data and in a second format stores audio data in such manner as to enable the dual format disc to be used in with apparatus adapted for playing both formats and with apparatus intended for playing either
- 25 one of the formats.

In a further preferred arrangement of such discs the material of one format is recorded on one surface thereof in DVD form, and on the other surface thereof the data provided upon this other surface is in another format.

5 Preferably, the format used for the second surface is compatible with the data recording formats as used for recording data on compact discs.

In a further aspect of the invention data recorded in two different formats are recorded on the same side of a recording disc of the size and dimensions for used for the playing of compact discs and or DVD discs in such manner that the separately recorded data can be subsequently selectively playable by appropriate
10 playback equipment.

Broadly according to a further aspect of the invention there is provided a recordable format that is capable of recording upon any one of or all of DVD-6, DVD-9, DVD-10 and DVD-16.

CLAIMS

- 1 Stored data playing and/or recording apparatus which is able to play and/or record stored data discs which in addition to carrying DVD data in a first format also carries data in a second format that is compatible with the conventionally available compact disc audio data.
5
2. Apparatus as claimed in claim 1, and wherein the apparatus is arranged to be capable of playing-back data carrying discs provided with/carrying data which has been recorded in a first format suitable for DVD purposes together with data in a second format that is suitable for conventional audio purposes.
- 10 3. Apparatus as claimed in claim 1 or 2, and adapted to playback and/or record data carrying discs each of which carries or is caused to carry data recorded on one outer surface thereof in DVD form which provides the first format, and on the other outer surface thereof has the data provided thereupon in audio form which provides the second format.
- 15 4 Apparatus as claimed in claim 1,2 or 3, and adapted for multiformat recording DVD data to be recorded in any one of or all of the formats associated with DVD recording and including DVD-5, DVD-9, DVD-10 and DVD-16 formats.
- 20 5. Apparatus as claimed in any one of the preceding claims, and wherein the multiformat recording capability is based upon enhancing or upgrading the chassis/motherboard of a DVD recorder intended for consumer use and/or the formation of a machine dedicated to the utilisation of the aforesaid DVDs.

6. Apparatus as claimed in any preceding claim, and including a balanced audio input/output arrangement adapted for effecting access to various tracks on a disc including MPEG-2 audio encoding, PCM or Dolby Digital in mono, stereo or multitrack including;
- 5 7. Apparatus as claimed in any preceding claims, and including time code (VITC) which can be internally generated, encoded into a video stream, displayed on screen and output to other devices in synchronisation;
8. Apparatus as claimed in any one of the preceding claims, and including PRRS-422 and control synchronisation inputs and outputs;
- 10 9. Apparatus as claimed in any one of the preceding claims, and including direct inputs/outputs of the MPEG-2 and audio streams to enable users such as broadcasters to interface the DVD/AUDIO format of the invention directly with the MPEG-2 output to be finally broadcast and to allow users such as producers to encode material in the correct format for MPEG-2 digital broadcasts;
- 15 10. Apparatus as claimed in any preceding claim, and including serial digital component RGB and YUV, IEEE1394 (firewire), Y/C composite and sync inputs/outputs;
- 11 Apparatus as claimed in any preceding claim, and including USB, SCSI and serial ports to allow the apparatus to interface with computers and workstations
- 20 for the control, synchronisation, data back-up, internal black burst, test signals and colour bar generation;
12. Apparatus as claimed in any preceding claim, and including a reference input for locking to an external source;

13. Apparatus as claimed in any preceding claim and wherein TOC is written to an area of the disc and available access to the discs technical information is either via the GUI or is displayed on a monitor.

14 Apparatus substantially as hereinbefore described.

5 15 A dual format data storage disc for use with apparatus as claimed in any one of the preceding claims, and including, a first format is adapted for storing video data in DVD format and in a second format for storing audio data in a format which enables the dual disc to be used in with apparatus for playing both formats and with apparatus intended for playing either one of the formats.

10 16. A dual format disc as claimed in claim 14, and which is adapted for storing audio and video material in DVD format, and which is adapted to store audio material in such manner that the additionally stored audio material format is playable by equipment capable of playing audio material containing compact discs only.

15 17. A dual format disc, wherein in a first format stores DVD video/audio material data and wherein the disc in a second format stores audio material data in such manner as to enable the dual format disc to be used in with apparatus adapted for playing both formats and with apparatus intended for playing either one of the formats.

20 18. A dual format disc as claimed in claim 16 or 17, and wherein the disc incorporates a stored material format which is satisfies the requirements of any one of or all of the formats associated with DVD-5, DVD-9, DVD-10 and DVD-16 stored data formats.

19. A dual format disc substantially as herein before described.

20. A method of enabling a data storage disc adapted for the storage of DVD format material to be playable upon apparatus capable of playing audio compact discs including the step of providing additional audio material upon the discs in such manner that it is playable by compact disc playing apparatus



INVESTOR IN PEOPLE

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): G5R (RB21, RHE, RLX)

Int Cl (Ed.7):

Other: Online: WPI; EPODOC; JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2309816 A (SAMSUNG)	1 to 14
X	EP 0899723 A2 (SAMSUNG)	1 to 20
X	EP 0834876 A2 (SAMSUNG)	1 to 14
X	EP 0831469 A2 (SAMSUNG)	1 to 14
X	WO 98/54704 A1 (DAEWOO)	1 to 14
X	WO 98/38637 A1 (WEA)	15 to 20

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.